

CLAIMS

1. A method of communication in a time division duplex (TDD) satellite
5 communication system comprising at least one satellite and a plurality of terrestrial
terminals; the method comprising allocating time division multiple access (TDMA)
time slots for transmission between the satellite and any one of the plurality of
terminals, such that for any given terminal, transmit time slots for transmission to the
satellite and receive time slots for reception from the satellite are separated in time;
10 wherein an assigned time delay between transmit and receive time slots at the any one
terminal is small compared with a round trip propagation delay; and wherein, if the
transmit time slot for one terminal causes a transmission from that one terminal to be
received at another terminal overlapped in time with a receive time slot allocated for
the other terminal, then those two terminals are spaced apart in distance, sufficiently,
15 such that interference between the two terminals is minimised.
2. A method according to claim 1, wherein signals between the terminals and the
satellite are synchronised at the satellite.
- 20 3. A method according to claim 1 or claim 2, wherein alternate time slots at the
satellite are used for transmission and reception.
4. A method according to at least claim 2, wherein the terminals use navigational
information to estimate their propagation delay to the satellite; and thus to determine
25 the time required to transmit into an allocated time slot.
5. A method according to claim 4, wherein the satellite transmits ephemeris data to
the terminals to aid in determining the propagation delay.
- 30 6. A method according to any preceding claim, wherein the position of each
terminal is determined by the satellite, using location data provided by each terminal.

7. A method according to any preceding claim, wherein downlink timeslots are allocated to terminals at random.
8. A method according to any preceding claim, wherein uplink timeslots are
5 allocated in order to avoid a transmission at one terminal being received by another terminal at a time for which the other terminal has been allocated a receive time slot.
9. A method according to claim 1, wherein terminal receive time slots are allocated randomly; wherein allocation of terminal transmit time slots includes the
10 steps of: calculating the minimum distance between a transmitting terminal and a receiving terminal which receives the transmission; repeating this calculation for all terminal transmit time slots; repeating the calculation for all terminals; calculating the resulting interference if each terminal used its worst terminal transmit time slot; ranking the terminals according to which cause the worst interference with another
15 terminal; and starting from the worst terminal, allocating the best time slot for that terminal, discarding terminal transmit time slots where transmit and receive time slots overlap in the same terminal.